



Compass INSPIRE Services

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Contents

Purpose of this Paper	3
What is a Spatial Data Infrastructure?	3
What is the INSPIRE Directive?.....	3
Who will be affected by the INSPIRE Directive?.....	3
Compass INSPIRE Services.....	4
Compass Programme Management and Planning Service	4
Metadata Services.....	4
Data Services	4
Network Services.....	4
Compass Programme Management & Planning Service.....	5
Information Asset Audit	6
What is the extent of your Metadata?.....	6
What format is your Metadata stored in?	6
How is your Metadata stored?.....	6
What Spatial Data does your organisation hold?.....	7
In what format is your Spatial Data held and stored?	7
Systems Review	7
Compass Metadata Service	8
Cataloging of Metadata according to one compliant format	8
Controlling Inconsistencies and Redundancies in Metadata	8
Translation of Metadata elements.....	9
Metadata Schema	9
Migration of Metadata to INSPIRE Compliant CSW Discovery	9
Compass Data Service	10
Data Centralisation & Transformation	10
Compass Network Services	11
Discovery Service.....	11
View Service	12
Download Service.....	12
What next for your organisation.....	12

Purpose of this Paper

This paper describes how the Compass Services can provide a full compliance solution to meet the requirements of the European Union INSPIRE Directive and assist participation of your organisation in your National Spatial Data Infrastructure (NSDI) strategy that must support INSPIRE. The services are also applicable for organisations wishing to create individual SDI components for their own use, based on acknowledged 'best practice' in creating SDIs, e.g. conducting information audits, creating and published metadata, mounting effective Geoportals.

What is a Spatial Data Infrastructure?

A Spatial Data Infrastructure (SDI) can be defined as a framework which integrates a set of resources, both human and technical - catalogues, servers, data, applications, web pages - to manage spatial information. An SDI also includes information access and sharing policies that encourage widest possible use of spatial data, and the legal means to enforce such policies. Successful SDIs are built 'bottom up', i.e. by organisations, public and private, working within various levels of government - local, regional (sub-national), and national.

What is the INSPIRE Directive?

The INSPIRE Directive – Infrastructure for Spatial Information in the European Community – is a legal Directive of the European Council and Parliament setting out the principles, goals and legal requirements for creating a harmonised pan-European SDI spanning all 27 EU Member States.

The INSPIRE Directive aims to create a European-wide Spatial Data Infrastructure (SDI) which will facilitate the sharing of spatial data amongst public organisations within Members States and across national boundaries in Europe, with EU Institutions - and with EU citizens. Implementation of the Directive currently focuses on the discovery of available data through metadata creation and discovery services (CSW), data viewing services (WMS) and data download services (WFS). Common data specifications for 34 data themes, and transformation services to achieve interoperability across multiple datasets, are the next phase of INSPIRE implementation, beginning in 2011. The ultimate goal of the INSPIRE Directive is to ensure interoperability of spatial data across Europe – for all those who need access, in the public and private sectors.

Who will be affected by the INSPIRE Directive?

Potentially all users and providers of spatial information will be affected. All public bodies are required to create INSPIRE compliant metadata and to provide access to the associated datasets & dataserries.

Compass INSPIRE Services

Compass Informatics has a proven expertise in solutions supporting the EU INSPIRE Directive.

These solutions are delivered to your organisation through the Compass INSPIRE Suite of Services which support full compliancy to the INSPIRE Directive.

Compass Programme Management and Planning Service

The Compass programme management and planning service is our way of assisting you in designing an approach to compliancy and in management of that process. It is based around an initial full information asset audit, in tandem with a systems review within your organisation. Once these have been completed, Compass will implement a bespoke compliancy solution to ensure that your organisation meets the requirements of the INSPIRE directive. This solution can be programme managed by our proven delivery team.

Metadata Services

Compass metadata services are designed to collect, harmonise, catalog and publish annex I, II & III themed metadata to the INSPIRE compliancy level using integrated open source and proprietary software tools.

Data Services

Compass Data services are designed to collect, centralise and transform data by schema mapping to an INSPIRE compliant schema which supports the INSPIRE concept of data interoperability.

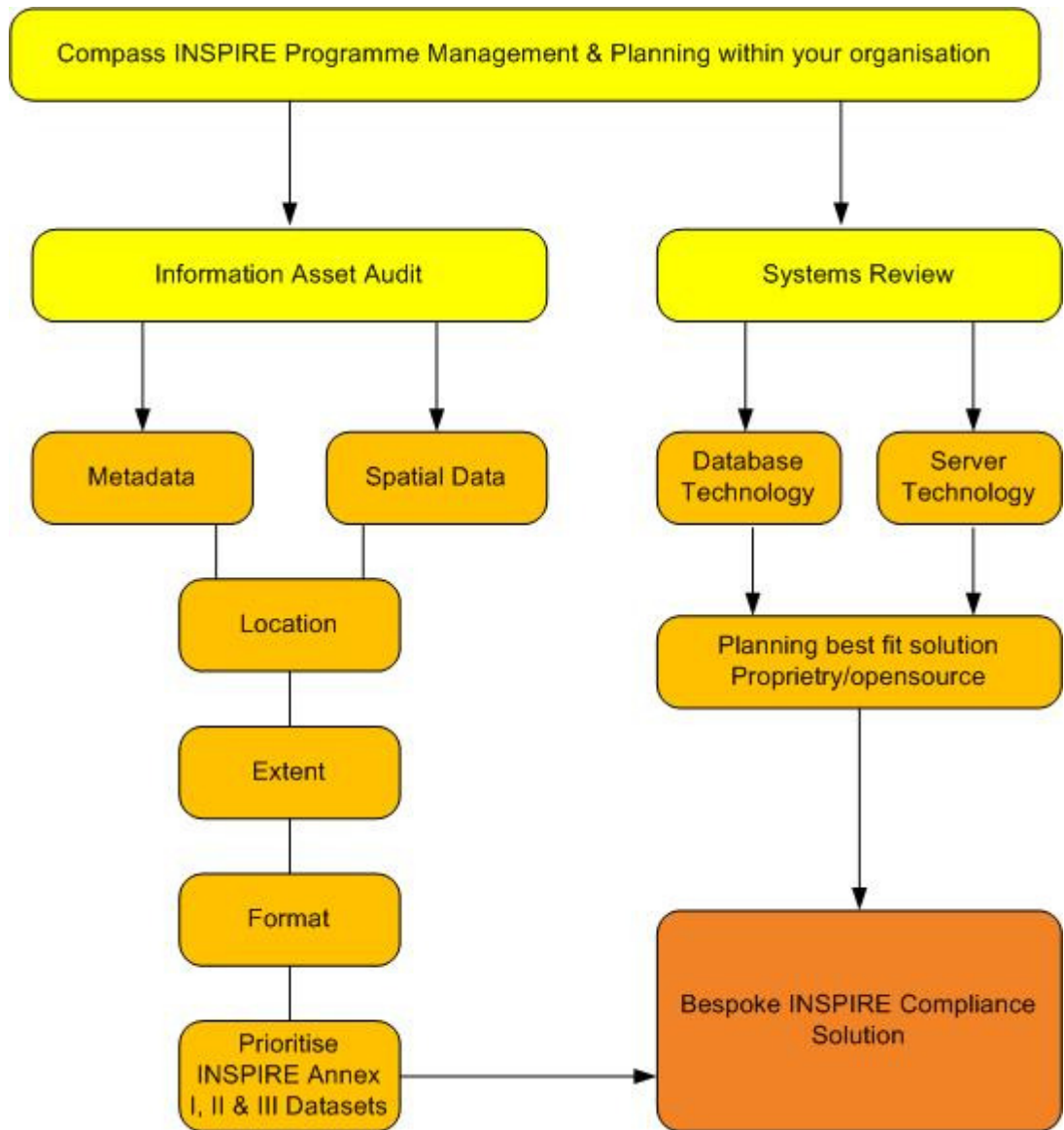
Network Services

Network services can be defined as the web accessible services required to make spatial data available to public users throughout the EU member states.

Compass network services will support discovery (CSW), viewing (WMS) and download services (WFS) to the INSPIRE Directive standard.

What is the workflow?

Compass Programme Management & Planning Service



Information Asset Audit

The INSPIRE Directive organises spatial data themes into Annexes I, II and III of the INSPIRE directive. Data and data documentation (metadata) which does not fall within one or more of these Annexes is not required to fulfil INSPIRE compliancy.

A full information audit of your organisations spatial data and data documentation is the initial step toward achieving compliancy. Therefore the following queries must be satisfied prior to implementation of the Compass metadata and data services:

What is the extent of your Metadata?

Metadata is 'data about data' which defines the content of a dataset or dataseries, making it possible to inventory, discover and use.

Compass will assess the extent of your existing metadata and prioritise in line with INSPIRE Annexes I, II & III. Compass will also identify metadata gaps and establish the requirements for additional metadata creation based on your organisations existing datasets.

What format is your Metadata stored in?

Metadata can be stored in a number of file formats such as excel, word, HTML, however, the preferred format for achieving INSPIRE compliancy and supporting Discovery Services is XML.

An xml metadata element is a discrete unit of metadata (ISO 19115/19139). Metadata elements are unique within a metadata entity. ISO 'Core Metadata Elements' are clearly defined within the INSPIRE Metadata Implementing Rules; Technical Guidelines (2007).

Compass will establish the formatting requirements of your organisations existing metadata and provide a best fit solution on the capture of metadata in a standardised XML format.

How is your Metadata stored?

Storing metadata in a common repository enhances its usability. Metadata may be stored within your organisation centrally (database/catalog) or a more fragmented flat file structure.

Compass expertise will locate metadata and centralise within an agreed catalog such as ESRI ArcCatalog or an Open source geospatial catalog such as GeoNetwork. Metadata will be centralised in a single compliant profile.

What Spatial Data does your organisation hold?

Is your data themed or categorised to an internally agreed standard and if so, which of these categories are themed per INSPIRE Annexes. Thirty four “spatial data themes” have been defined in three Annexes in order of priority. The Compass Data Service will assess the spatial data types (datasets & data series) within your organisation and prioritise in line with INSPIRE Annexes I, II & III.

In what format is your Spatial Data held and stored?

Spatial data can exist in many formats including Shapefile, database tables, MapInfo, Raster & Vector. In addition to this, the storage structure of spatial data within an organisation can often be fragmented with options such as a flat file structure held across numerous directories, existing databases or archives.

The Compass information audit will assess your organisation's data formats and storage structures and plan for a best fit solution to centralise your spatial data in a single format which is supported by the server technologies available.

Systems Review

Compass will carry out a systems review within your organisation to establish a full picture of the infrastructure that may be available to support INSPIRE compliance. Questions will include...

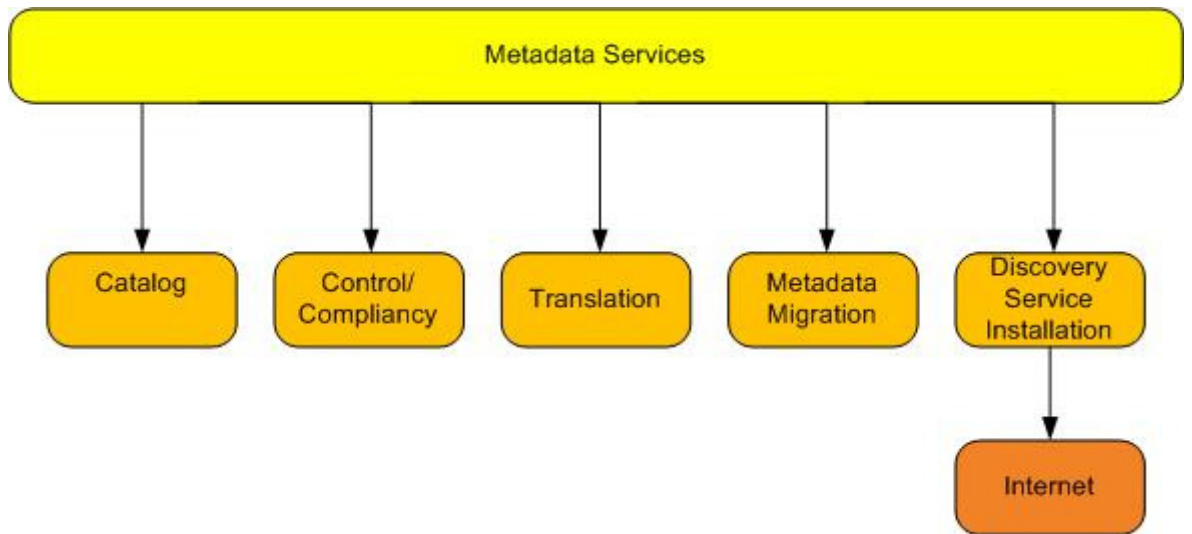
:: What database technology are you using at the moment? E.g. Oracle, SQL Server.

:: What server technology are you using? E.g. ArcGIS Server, Geoserver, Mapserver.

:: Is your organisation currently publishing spatial data using web services, and if so using what approaches and standards?

On completion of both the Information Asset Audit and the Systems Review, Compass will design and implement a bespoke compliance solution to ensure that your organisation meets the requirements of the INSPIRE directive. This compliance solution is supported by Compass Metadata, Data & Network Services.

Compass Metadata Service



Cataloging of Metadata according to one compliant format

File level metadata within an organisation is often automatically captured by the operating system and only describes an objects external attributes such as file size and creation date. It does not capture information regarding data content.

Compass INSPIRE Metadata Service collects all INSPIRE Annex 1, II and III spatial data documentation to a centralised geospatial catalog. This requires the importation of externally held xml files into a proprietary or open source catalog which supports either ISO 19115/19139 or an INSPIRE compliant schema as destination profiles.

Controlling Inconsistencies and Redundancies in Metadata

Ultimately, metadata must fulfil the mandatory INSPIRE compliancy requirements as specified by the INSPIRE Metadata Implementing Rules. A core component of achieving this is the initial editing, formatting and population of individual metadata elements to the ISO Core 19115/19139 standards of which, the Compass INSPIRE team has proven technical expertise in formatting metadata elements using open source tools such as xml editor.

Translation of Metadata elements

ArcCatalog currently supports the translation of ISO 19115 to ISO 19139 via the XSLT translation tool and is used as a component part of Compass INSPIRE Metadata Service however, open source catalogs such as GeoNetwork do not require the use of XSLT translator as metadata is generated directly into either ISO 19139 or an alternative INSPIRE compliant schema.

Metadata Schema

Compass can provide an INSPIRE compliant metadata template supported by an open source geospatial catalog to ensure that the metadata you prepare is in the required format and structure.

Migration of Metadata to INSPIRE Compliant CSW Discovery

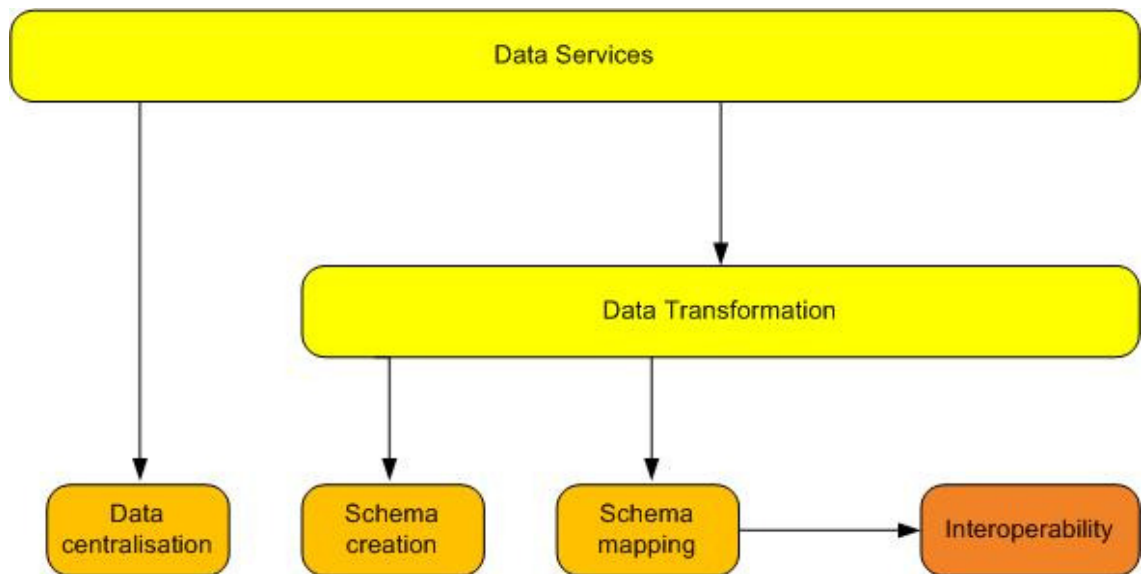
Metadata which has been collected, edited, formatted and translated to INSPIRE compliant format, is migrated, in xml format, to an open source Geospatial catalog such as GeoNetwork via individual file upload or batch upload.

GeoNetwork is the preferred open source CSW discovery solution. Supply and installation of the GeoNetwork CSW, connection to relational database (SQL, Oracle) and live server is a component part of the Compass INSPIRE Metadata Service.

GeoNetwork comes with a McKoi relational database (DBMS) embedded which is used by default during installation. This DBMS can be used for small or desktop installations. Connection to an alternative stand alone DBMS can also be established. The GeoNetwork database connection options are as follows:

- :: SQL Server 2008
- :: Oracle
- :: PostGIS

Compass Data Service



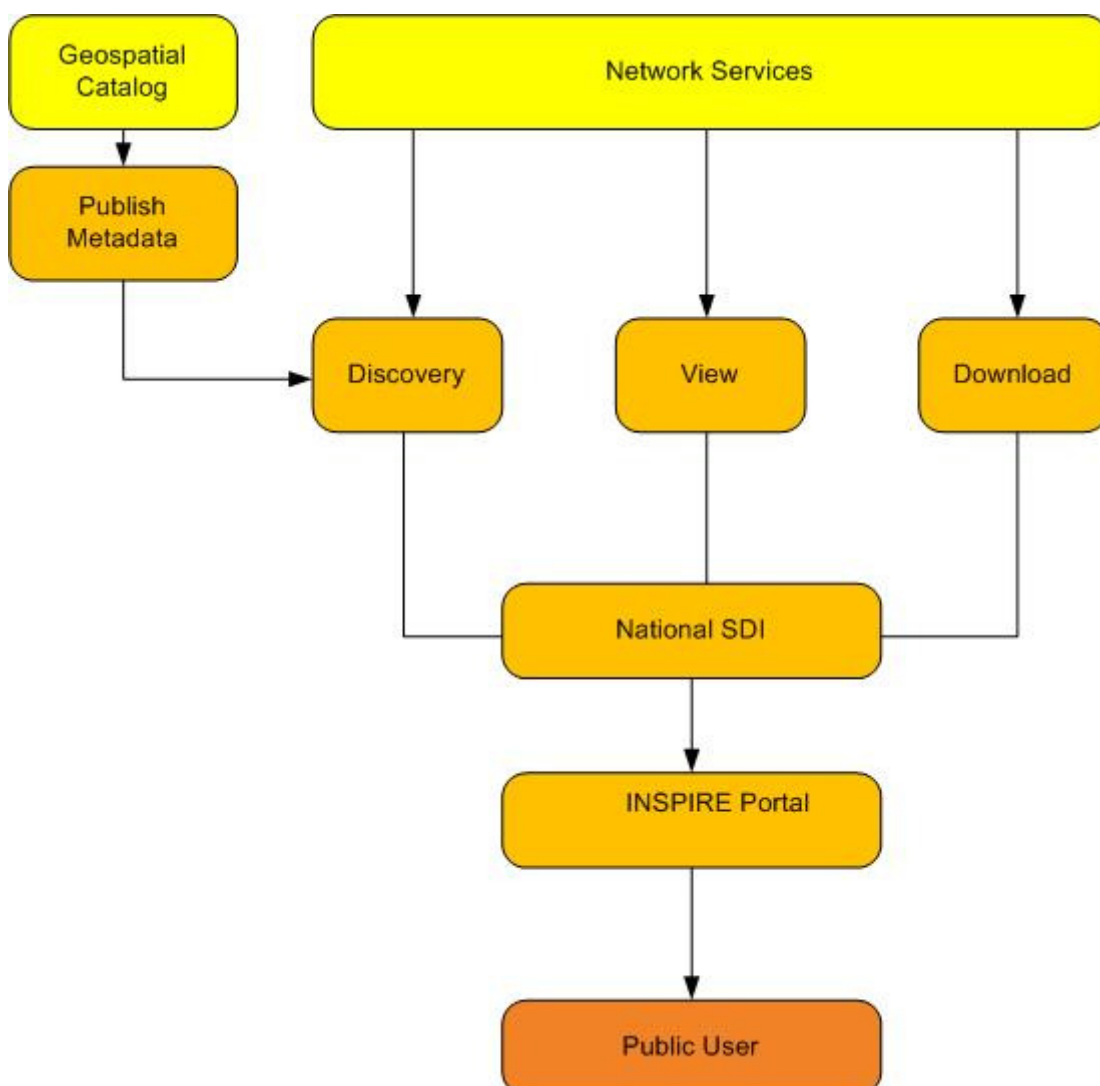
Data Centralisation & Transformation

Compass supports your organisations compliance solution by collecting spatial data to a single location such as a Geodatabase. Centralisation of your organisations data will be subject to the final data format.

Compass technological expertise can provide full schema mapping from your organisations data schemas to the INSPIRE compliant data schemas which fulfils the mandatory compliancy for Download services. A component part of the Compass data service is the use of open source applications that support schema mapping such as HALE.

Data schema mapping to the INSPIRE compliant standard is a core to achieving European wide data interoperability.

Compass Network Services



Discovery Service

'The goal of a discovery service is to support discovery, evaluation and use of spatial datasets based on their metadata properties' (Infrastructure for Spatial Information in Europe, 2007).

The Compass compliancy solution provides functionality for users to manage and search catalogs by:

- :: Connecting catalog software to appropriate database
- :: Installing alternative server technology to the Geonetwork inbuilt jetty server such as TomCat
- :: Installing a CSW service wrapper for INSPIRE compliancy

View Service

The INSPIRE Directive requires that view services make it possible to display, navigate, zoom, pan or overlay spatial data and view associated data legends.

The Compass compliancy solution supports your organisation by:

- :: Installing Server technology (ArcGISServer, MapServer, GeoServer)
- :: Publishing your organisations data via server technology

Download Service

The INSPIRE Directive requires the operation of a download service whereby datasets can be accessed directly by public user and the option to download the data is available.

The Compass compliancy solution supports you by:

- :: Making data available for download on dedicated server whereby viewing server and download server should be the same solution
- :: Supporting download of partial or complete spatial datasets

*Contact
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What next for your organisation

Contact Compass to arrange an initial scoping meeting or conversation on the INSPIRE Directive and how Compass can support you towards achieving compliancy.

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INSPIRE Spatial Data Themes

:: Annex I:

Coordinate reference & grid systems
Geographical names
Administrative units
Addresses
Cadastral parcels
Transport networks
Hydrography
Protected sites

:: Annex II:

Elevation
Land cover
Ortho-imagery
Geology

:: Annex III:

Statistical units
Buildings
Soil
Land use
Human health and safety,
Utility Government services
Environmental monitoring facilities
Production and industrial facilities,
Agricultural and aquaculture facilities
Population & demography
Area management/restriction/regulation zones and reporting units
Natural risk zones
Atmospheric conditions
Meteorological geographical features
Oceanographic geographical features
Sea regions
Bio-geographical regions
Habitats and biotypes
Species distribution
Energy resources
Mineral resources

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